

As examiner pointed out in Item 31, former claims seem fail to explicitly describe that tempo can move along the music. Claims are currently amended to improve this matter.

### **Two types of music style**

Type A: music with constant tempo.

Type B: music with moving tempo.

Type A includes but not limited to march, rock, Karaoke song, and those which can be played along with rhythm machine. Type B includes but not limited to aria in Italian opera, Russian or East European folk music, and slow movement in concerto piece in Romantic Era.

This application is about metronome which can be used for type B music.

All of conventional metronomes and devices, systems having metronome like function have been for type A music. Of cause these device or systems can be set into different tempo at first. But, once start, they keep tempo constant.

All cited patents in the office action are also for type A music. I could not find any patent applied before year of 2004, which describes device or system applicable to type B music.

Idea of “metronome responding to moving tempo” is new itself.

### **ITEM 30**

Examiner protests as “BPM is the timing of beat by definition”.

In the application of '492, BPM is defined as “beats-per-minute” (in the top paragraph of description). The same definition is shown in *Essential Dictionary of Music* published from Alfred Publishing Co. So, Applicant believes BPM is an answer to the question “How many beats in one minute?” Example of answer is “120” for typical march, or 80, 132 etc. BPM represents one numeric value. Examiner’s argument needs written definition with reference on which it stands on. Even there is another definition, it is clear that '492 stands on definition of beats-per-minute.

### **What the system of '492 does.**

As '492 is main reference on which examiner’s rejection stands on, applicant carefully read specification of this patent. And following is summary of the patent.

System of '492 deals with Type A music. Tempo is assumed to be constant.

So, BPM should be one value (at least locally).

Value of BPM can be gotten as 60 divided by beat duration time (measured in second).

Computer analysis of sound data gets plural candidates for beat duration time as time length between adjacent sound edges. These are corresponding to quarter notes, eighth notes and other notes (figure 1).

To decide which candidate is correct one corresponding to BPM, it solicits user's tapping input.

User's tapping input is not accurate.

To get best match, system asks user to input a little while (not necessarily whole length of music).

## **ITEM 27 and 29**

Examiner describes as "sound data contains data about each beat duration time ....".

In wider interpretation it does. But, sound data is not ready to use for metronome device or system. Explicit numeric data as beat duration data is necessary for metronome of this invention.

'492 describes in three paragraphs at top of first BACKGROUND OF THE INVENTION, that most people can determine beat or tempo from music sound, but it is difficult for computer to decide tempo.

"Determining the "beat" or tempo of a piece of music is an ability that comes naturally to most people." (First paragraph)

"Thus, those that are skilled in the art will recognize that these, and many other, practical problems make automatic tempo determination a difficult problem for a computer generally," (third paragraph)

For that reason, invention of '492 was done.

'492 is for tempo determination, that is getting one numeric BPM data. I think detection of individual beat timing (not sound timing) is more difficult unsolved challenge with current art especially for type B music. Because sound edge may be absent at beat timing.

I think, in academic field, researchers are challenging to solve this problem. But, I don't think it is in practical level in view point of reliability (100% sure) and compactness (not big program).

With current art, human assistance is necessary to get all individual beat duration data from audio data. Then, audio data is not ready to use for metronome of this invention.

#### ITEM 28

Applicant intended to mean "all" by "each one by one" in claim 2. Applicant's intention is written in paragraph [0013] of specification, there written

"all beat duration data and meter data for music work or its portion are stored in a memory."

Wording in Claim 2 will be amended as "all individual".

Now, one of issues is if all beat timing are input and stored or not with '492.

In column 12, there written:

"the user-based estimation process will preferably continue for **so long as the user desires**, until the end of the music is reached, and/or **until the monitoring program has a sufficiently accurate estimate of the BPM** from the user."

This means in some case user input go all through the music, but in other case user input ends in the middle of music.

Also, in the following paragraph, it describes as:

"Note that the previous method makes it possible to determine with high accuracy the BPM of the music after **only a very short period of tapping** by the user. In a typical case, it may require only a few seconds of user tapping before a BPM can be selected. "

From both description, in '492, in many case input continues for only part of music.

Even in case input continues to the end of music, individual timing data is not necessary stored into individual place in memory. This is because the computer program gets a)average, b)close or c)most nearly matches, and so, it uses only memory place of one or two values with usual programming method. It is not necessary to store all individual beat duration data.

### **Item 31**

Applicant appreciate examiner's point out here. It was not expressed explicitly. So, Claim 1 and Claim 4 are amended to show limitation in preamble by adding "of music with moving tempo". Also, in the first means and the first program, use "all individual" beat duration time data. Word "individual" implies that each can take different value independently, and further implies tempo varies along music.

### **ITEM 32**

Discussed in ITEM 12 under.

### **ITEM 33**

Applicant think about this matter. In case '492 is used for refusing component means or program, it is confuted.

## **SPECIFICATION**

### **ITEM No. 1**

I sent question about re-writing on specification to Examiner by FAX on 8/3 and 8/4. There was no response.

Purpose of re-writing specification is, as you told in Office Action of 10/20/2008, to make "specification to be written in "full, clear, concise and exact terms". But, It seems English has not distinguishable two words for two concepts both expressed by "beat".

I used two words "takt" and "beat" in original specification to distinguish concepts they represent:

takt — timing corresponding end point of movement of conductor's baton or a metronome.

beat – timing or time length of basic note corresponding to denominator in time signature.

As "takt" is not English but German word. I don't know other word than "beat" as English translation. So, I replace it with "beat". Then, I need replace "beat" in original specification with some English expression other than single word "beat". I thought

“basic note corresponding to denominator” in [0039] and “said basic notes” and “basic note” in [0040] were just replacement to make it exact terms, and did not think they were new matter. Without replacement, phrase in 7th line of [0039] becomes

“beat number in one beat” .

You can see this is nonsense.

I choose “beat in meter” for replacement of “beat” in original specification at [0039] and [0040].

Amendment to [0002] is added to make clear for reader the use of terminology related beat. It is known as base knowledge at least to orchestra musicians. It does not contain description about invention, and is not new matter. But, I do not insist to add this explanation and eliminated it.

Amendment in [0007] and [0054] are desirable but not vital, and I resumed it to original.

Replacements in [0051] were to correct error happened in translation process (Japanese to English). You can see original Japanese in PCT application PCT/IB2005/000715 at WIPO digital library on web. I attached cover page and corresponding page to paragraph [0051] copied from WIPO web page.

So, correction at last time amendment are left.

#### **RESPONSE TO CLAIM REJECTION – 35 USC § 101**

##### **ITEM No. 3, Claim 8:**

Claim 8 is canceled.

#### **RESPONSE TO CLAIM REJECTION – 35 USC § 112**

##### **ITEM No. 6, Claim 6:**

Second step in Claim 6 and Claim 9 are currently amended to clarify the process.

##### **ITEM No. 7, Claim 11:**

There was mistake in language translation. Word “measure” was wrong and replaced by “meter”. Also, more clear structure of sentence is used.

## **RESPONSE TO CLAIM REJECTION – 35 USC § 102**

### **ITEM No. 11, Claim 4:**

Claim 4 is currently amended to clarify beat duration are individually different and then the metronome can be used for music with moving tempo. Second program is more explicitly expressed about meaning of “measure”.

‘492 is different with this invention from the view point of purpose and components as shown under. And input / output relation is opposite.

In ‘492:                    input: sound data,                    output: BPM value

This invention:    input: all beat duration time data, output: tick sound or swing display.

- (1) As described in above ITEM 30, final BPM in ‘492 is one numeric value, and displayed as numeric characters. It does not display consecutive timing of beats.
- (2) Again, it is a problem that English word “beat” has plural meaning. In description at col.5 and 6 in ‘492, process of getting “beat” position from audio file is shown. Here “beat” is used as “sound edge” or “attack of sound”. (Column 6 line 40 “a beat--i.e., the attack”)
- (3) What is stored in original file is sound data, not beat (of metronome) duration time. Then, first program is different with process in ‘492.
- (4) Word “measure” has two side meaning: (i) given two timings and get time length between these two timings, (ii) given time length and start timing and get timing after given time length from start timing. Col.6 in ‘492 describes how to measure in meaning of (i). In Claim 4 of this invention, “measure” is used in the meaning of (ii). Then, second program is different from process in ‘492.
- (5) “Displaying” in Claim 3 of ‘492 means numeric display and different with timing indication of this invention.

### **ITEM No. 12, Claim 5:**

Claim 5 is dependent claim of claim 4. As Claim 4 is different with contents of '492, Claim 5 is not identical to contents of '492. Further there are differences in fourth and fifth program.

#### Fourth program

In Claim 5 ("each one by one" is replaced by "all individual")

"fourth program for input of all individual beat timing from a mouse or other device operated by user for initial input or partial modification purpose"

In reference '492

As described in above ITEM 28, "tapping along" in '492 is not necessary to cover whole music. There is no description about partial modification of beat timing.

#### Fifth program:

In Claim 5

"fifth program for recording all individual beat duration data on memory or media based on input by fourth program"

In reference '492

For process written in col. 12 in '492, individual tap interval time is not necessary to be stored if general programming technique is used. Only total value and number of taps for calculating average (line 26), most close (line 33) data, or most nearly match (line 37), are enough to be stored in temporary working memory, and can be erased after getting final BPM. There is no description about storing individual beat timing in col. 12. Because the purpose of this process is choose one from plural BPM candidates, and used data in process is not necessary after.

#### **ITEM No. 13, Claim 8:**

Claim 8 is canceled.

#### **RESPONSE TO CLAIM REJECTION – 35 USC § 103**

#### **ITEM 15**

Patent '853 is added as reference. '853 includes metronome function, but its tempo is constant once set by "tempo control knob 42" in Fig. 3. So, this is for Type A music, constant tempo music.

**ITEM 16, Claim 1:**

As stated above, claim 3 in '492 disclose display of BPM value. So it should be numeric character display, not timing display.

First means:

Col.5-6 in '492 describes reading out of audio data from file. Not beat duration time. Even human can recognize beat timing from audio data, it is difficult for computer to get individual beat duration time. "beat" in Claim 1 is beat of metronome. In '853, beat duration of metronome function is set by operator by adjusting control knob. So, it is not driven by stored data.

Second means:

Col. 6 in '492 describes measuring of beat intervals. But, there "beat" means sound edge, and "measure" means getting time intervals of two sound edges.

As stated in ITEM 11 (4), word "measure" has two side meaning, and "measure" in col. 6 in '492 means (i): given two timing and get time interval between the two timing.

In Claim 1, "measure" means (ii); given time interval and starting timing and get timing after given time length from start timing. This is obvious because first means gives time intervals, and third means use gotten timing.

In '853, oscillator 32 and counter 34 measure beat timing (in meaning of (ii)). But it is constant, and not measures different one by one duration time.

Third means:

Claim 3 in '492 display BPM value in numeric character display. It does not show consecutive beat timing.

In '853, metronome display shows timing of beat.

**ITEM 17, Claim 1 continued:**



Display in '492 is not useful to show consecutive beat timing. And as stated above total process is in reverse direction: getting BPM value from audio data. Component process are different with this invention.

Both '492 and '853 is used for type A music. They have not means to indicate all individual beat timing which may be different each other. In other words, both have not first and second means in this invention. No conventional metronome or metronome like device or system has these two means.

Paragraph bridging Col. 1-2 in '492 describes many applications to overlapping one after one performance. This is possible because both music are type A and adjusting tempo is simple. This invention is for type B music.

**ITEM 18, Claim 2:**

Same discussion with ITEM 12 is available here.

Claim 2 is dependent claim of claim 1. As Claim 1 is different with contents of '492, Claim 2 is not identical to contents of '492. Further there are differences in fourth and fifth means.

Fourth means

In Claim 2 ("each one by one" is replaced by "all individual")

"fourth means for input of all individual beat timing from a mouse or other device operated by user for initial input or partial modification purpose"

In reference '492

As described in above ITEM 28, "tapping along" in '492 is not necessary to cover whole music. There is no description about partial modification of beat timing.

Fifth means:

In Claim 2 (currently amended)

"fifth means for recording all individual beat duration time data acquired ~~by~~ from fourth means on memory or media"

In reference '492

For process written in col. 12 in '492, individual tap interval time is not necessary to be stored if general programming technique is used. Only total value and number of taps for calculating average (line 26), most close (line 33) data, or most nearly match (line 37), is enough to be stored in temporary working memory. There is no description in col. 12 about storing individual beat timing into file.

**ITEM 19, Claim 3:**

'982 shows vertical bar of LED array. And light point go up and down.

Then Claim 3 is amended to limit more detail control of lighting. Supporting description is in paragraph [0051].

**ITEM 20 ~ 22**

**Point of Claim 6 and Claim 9:**

Applicant think novelty of each step is not central matter of Claim 6 and Claim 9.

What is the difficulty to produce the Karaoke recording for type B music?

In most case, soloist is responsible to tempo deviation. In an aria of opera or slow movement of concerto work, after one or two beat *ritardando* some note is expanded more than double length of surrounding beat. Length of expanded beat may be determined by breathing capacity, status of throat muscle, feeling, music style, etc. So, it is difficult for conductor to conduct back orchestra without soloist.

This means immediate start from step three (recording exclude soloist) is difficult or makes recording of not good quality. Point of Claim 6 and Claim 9 is there are preparing steps of first and second step. And with metronome of this invention, it is easy to follow the beat by beat tempo of first step performance with soloist. So, sequence of four step is main point.

**ITEM 20, Claim 6 and 9:**

Second step in Claim 6 and Claim 9 are amended to clarify the process.

As stated above, '492 and '853 do not teach the concepts of claims 1, 2, 4, and 5. And '492 does not teach second step of Claim 6 and Claim 9, which is same functional elements included in Claim 1 or Claim 4.

**ITEM 21, Claim 6 and 9 continued:**

Technique in '492 can be used for type A music.

**ITEM 22, Claim 6 and 9 continued:**

Patents '832 and '724 are added to references.

Technique in '832 can be used for basically type A music. Even tempo shifts due to performer's feeling or degree of elation, it shifts gradually and locally it is type A. Also, to use technique, there is implicit assumption that there are sound edge or attack at beat position. So applicable music style is limited.

**ITEM 23, Claim 7:**

It is current art to control sound data on two trucks individually on or off. But, Claim 7 intends to claim to have different kind of data on a media, that is, one is conventional audio data and the other is digital data of beat duration data which is loaded and used on a metronome of this invention.

Claim 7 is amended to clarify this matter.

**ITEM 24, Claim 10 & 12:**

Claim 10 & 12 are withdrawn.

**Claim 11**

Claim 11 is currently amended and left.

As shown in Fig. 2, end point of upper ward motion is determined by next beat. That is, if next beat is 1<sup>st</sup> beat, it is 1.0 (full swing), if sub-major beat, it is 0.7, if non-major beat, 0.5. These value are example. End point of down ward motion is determined by if next beat is back-beat of subdivided beat or fore-beat. For example 0.3 and 0 for each. So, it helps user to recognize which beat position in a bar coming next.

## CONCLUSION

Specification is amended to use right terms but no addition of new matter.  
And correction against errors occurred in original translation is left in specification.

Claims 8, 9, 10, 12 are canceled.

Further examination is appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Seiji Kashioka', with a stylized, cursive script.

Seiji Kashioka